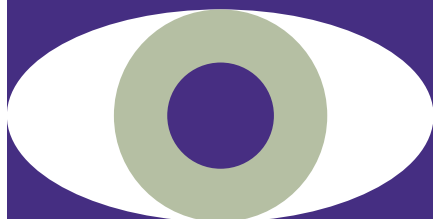


# Conference Report



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# Acronyms, abbreviations and terminology

|                   |   |
|-------------------|---|
| <b>AIDS 2022</b>  | 24th International AIDS Conference  |
| <b>ART</b>        | Antiretroviral therapy  |
| <b>BNAbs</b>      | Broadly neutralizing antibodies   |
| <b>COVID-19</b>   | Coronavirus disease 2019  |
| <b>CROPrEP</b>    | China Real-world Orally intake PrEP   |
| <b>DAIG</b>       | German AIDS Society   |
| <b>DSD</b>        | Differentiated service delivery   |
| <b>IAS</b>        | International AIDS Society  |
| <b>IAS 2019</b>   | 10th IAS Conference on HIV Science  |
| <b>IAS 2021</b>   | 11th IAS Conference on HIV Science  |
| <b>IAS 2023</b>   | 12th IAS Conference on HIV Science  |
| <b>ICASA</b>      | International Conference on AIDS and STIs in Africa   |
| <b>NGO</b>        | Non-governmental organization   |
| <b>PCR</b>        | Polymerase chain reaction   |
| <b>PEPFAR</b>     | President's Emergency Plan for AIDS Relief  |
| <b>PrEP</b>       | Pre-exposure prophylaxis  |
| <b>SARS-CoV-2</b> | Sudden acute respiratory syndrome coronavirus 2   |
| <b>STI</b>        | Sexually transmitted infection  |
| <b>TB</b>         | Tuberculosis  |
| <b>TLR-7</b>      | Toll-like receptor 7  |
| <b>Trans</b>      | May refer to transgender, transsexual or any other non-binary identification of sex or gender |
| <b>UNAIDS</b>     | Joint United Nations Programme on HIV and AIDS  |
| <b>U=U</b>        | Undetectable equals untransmittable   |
| <b>WHO</b>        | World Health Organization   |

# Terminology

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## Key populations

Refer to men who have sex with men, people who inject drugs, sex workers and transgender people.

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## Vulnerable populations

Refer to people living with HIV and groups outside of key populations who may be at increased vulnerability of acquiring HIV, for example, adolescents, Indigenous peoples, migrants, refugees, internally displaced persons, people with disabilities, people in prisons and other closed settings, people of advanced age, women and girls.



# IAS 2021 at a glance

---



**Over 6,000** participants from **135 countries** tuned in to IAS 2021



**101 pre-recorded and live sessions** and **52 satellite meetings** covered the full spectrum of HIV science and policy



**Half of delegates** were aged **45 years or younger**



IAS awarded **644 scholarships** to take part in IAS 2021, including **350 conference scholarships** awarded to participants from sub-Saharan Africa



**86% of delegates agreed** that the conference objectives were met



**92% of survey respondents** were satisfied with the choice and quality of the presenters



**10.1 million people were reached** through 3,616 social media posts



IAS 2021 generated more than **300 original news stories**

# Introduction

Just over 6,000 HIV professionals and community members met virtually and in Berlin, Germany, for IAS 2021, the 11th International AIDS Society Conference on HIV Science, on 18-21 July 2021. For the second year, a conference of IAS – the International AIDS Society – was delivered as a largely virtual event in response to the global COVID-19 pandemic. IAS 2021 was a hybrid conference, featuring live broadcast sessions in Berlin and online live and recorded, on-demand sessions.

IAS 2021 took place on the 40th anniversary of the first reports of AIDS in the United States, the first in an epidemic that went on to claim over 36 million lives globally. The conference included numerous sessions on the intersection between HIV and the new

pandemic of COVID-19. Conference sessions highlighted the special challenges that COVID-19 poses for the HIV response, as well as the foundation that 40 years of work in HIV provided for the response to COVID-19.

“The work that has been put into ... developing an HIV vaccine has really opened the door to a spectacularly successful set of COVID-19 vaccines.”

Anthony Fauci,  
Director, US  
National  
Institute of  
Allergy and  
Infectious  
Diseases [1]

IAS 2021 also provided a platform to highlight the need for prioritization of people living with HIV as COVID-19 vaccines are rolled out, together with equitable access to COVID-19 vaccines for countries with a high prevalence of HIV.

The conference featured 13 oral abstract sessions with live questions and answers and 21 on-demand oral abstract sessions. Sixty-seven invited speaker sessions, including seven prime sessions, covered cutting-edge topics in HIV treatment and

prevention, COVID-19, HIV cure research and implementation science. Fifty-two satellite meetings offered further insights into numerous aspects of the HIV response.

In all, 2,041 abstracts were submitted to IAS 2021, of which 880 were accepted, an acceptance rate of 43%. More than half of authors of accepted abstracts were female (53%), just over one in four was in sub-Saharan Africa (26%) and 40% were in the United States and Canada.



**IAS 2021 International Co-Chair (IAS President)**  
Adeeba Kamarulzaman, Malaysia



**IAS 2021 Local Co-Chair**  
Hendrik Streeck, Germany



# Who was there?

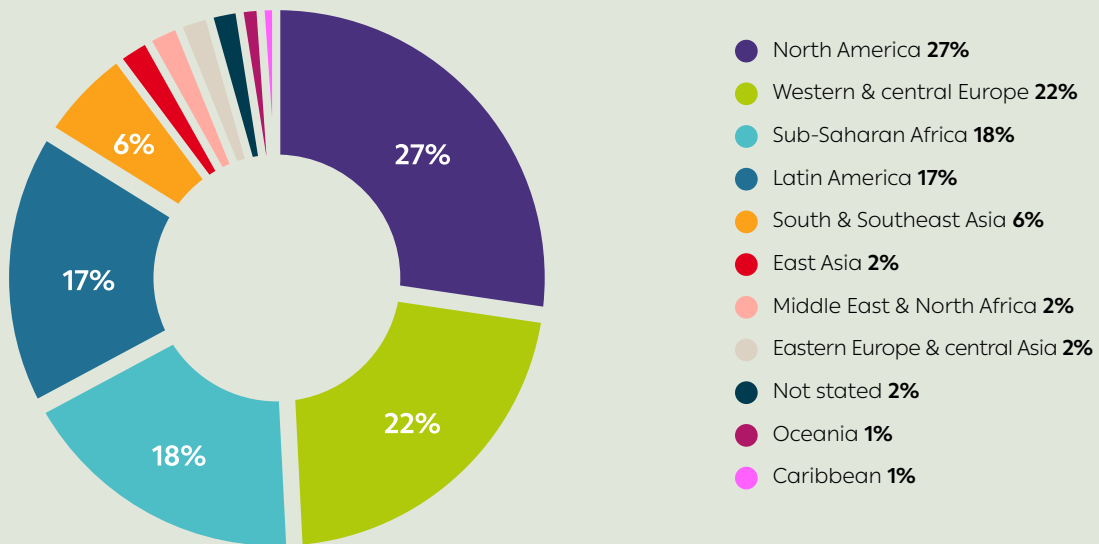
A total of 6,289 participants registered for IAS 2021, including 6,202 delegates. The remainder were organizers and staff. Ten percent of delegates were scholarship recipients.



## Country and region

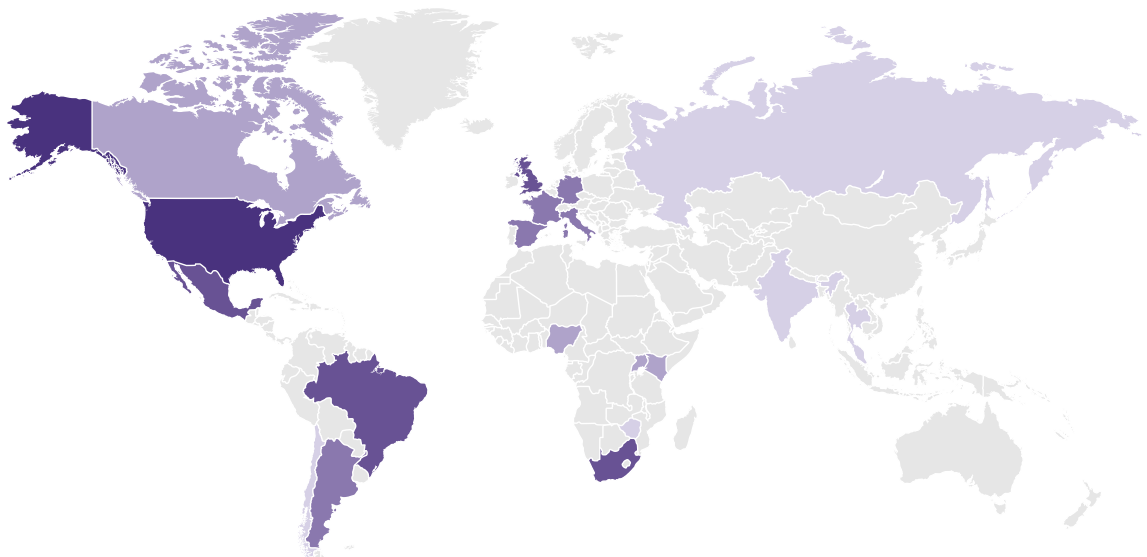
Overall, 27% of delegates were from North America, 22% from western and central Europe, 18% from sub-Saharan Africa and 17% from Latin America. Representation of western and central Europe was substantially higher than at IAS 2019, the 10th International AIDS Society Conference on HIV Science (14%).

**Figure 1: Delegates by region**



A total of 135 countries were represented at IAS 2021. The United States (1,553 delegates), Mexico (317 delegates) and the United Kingdom (306 delegates) had the largest representation at the conference. Compared with IAS 2019, sub-Saharan African nations were more likely to feature in the top 20 countries represented at IAS 2021. Kenya, Nigeria, South Africa, Uganda and Zimbabwe were each represented by more than 100 delegates and accounted for almost 13% of all delegates at IAS 2021.

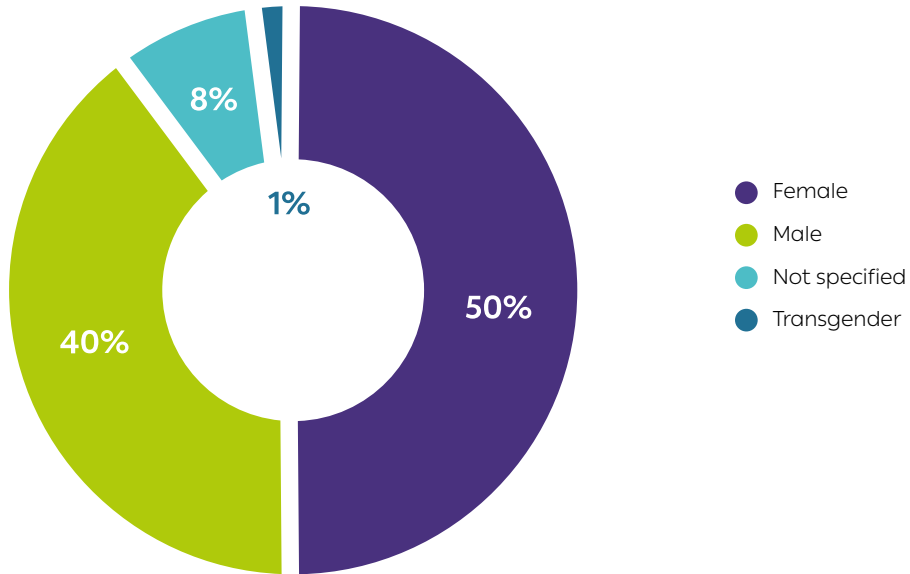
**Figure 2: Top 20 countries represented at IAS 2021**



## Gender

Fifty percent of delegates were female, 40% were male and 2% were transgender. Eight percent did not specify their gender.

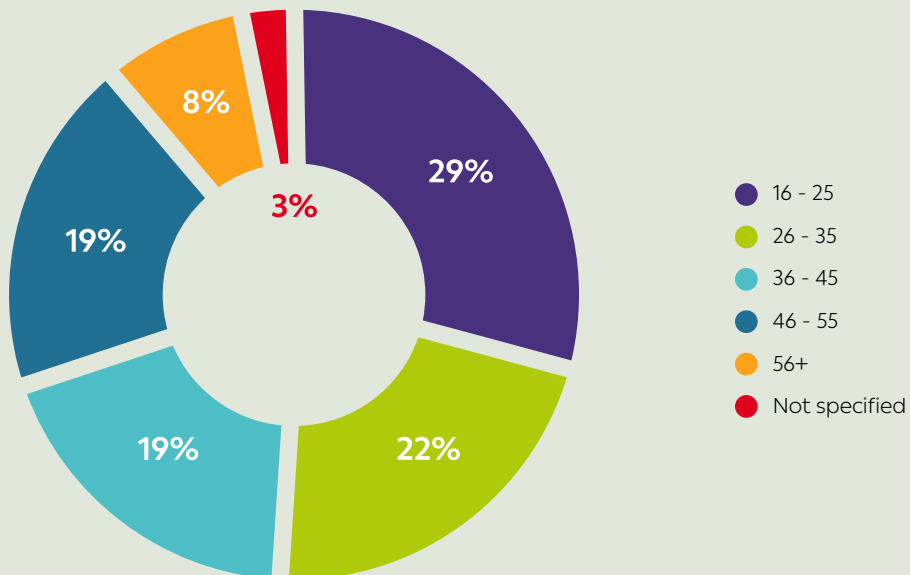
Figure 3: Delegates by gender



## Age range

Just over half of delegates at IAS 2021 were younger than 45 years and one in four were younger than 26 years. This continued the shift towards a younger delegate profile observed at IAS 2019.

Figure 4: Delegates by age range

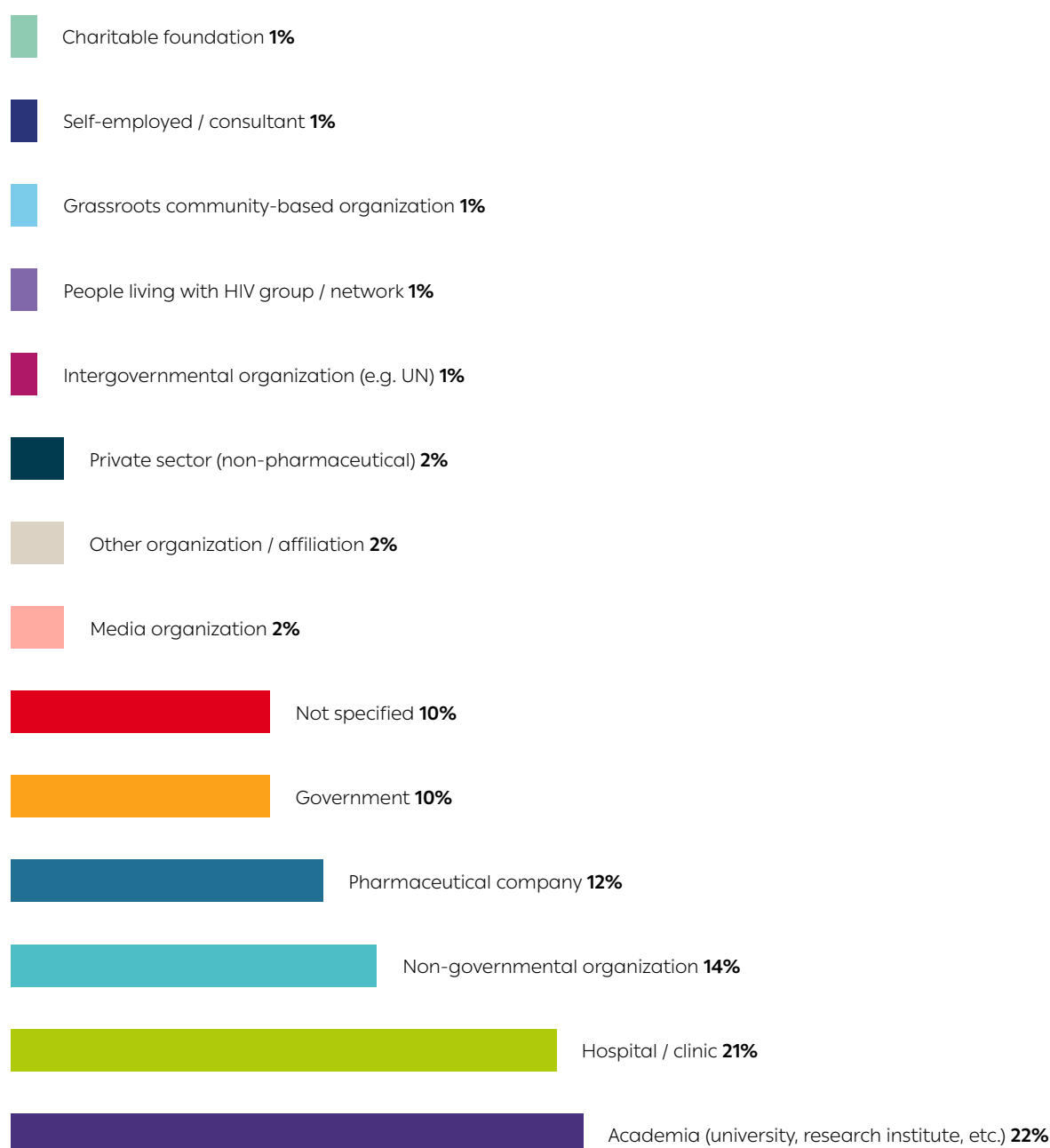


## Affiliations and institutions

People from academia (22% of the total; 1,342 delegates) and those working in hospitals and clinics (21%; 1,291 delegates) made up the largest share of delegates at IAS 2021. The percentage of hospital and clinic staff was 4% higher than at IAS 2019 – possibly a positive effect of the virtual format of the conference that allowed clinicians to join without the need to arrange cover for hospital

shifts. Delegates from non-governmental organizations (NGOs) accounted for 14% (889) of delegates at IAS 2021 compared with 19% (939) at IAS 2019. Pharmaceutical company representatives made up 12% (761) of delegates at IAS 2021 compared with 16% (791) at IAS 2019.

**Figure 5: Organizational affiliation**



## Scholarship awards

IAS 2021 awarded 644 scholarships to delegates from 73 countries (331 IAS Scholarship Programme awards, 301 IAS Educational Fund awards and 12 Media Scholarship Programme awards). Scholarship recipients were most commonly from sub-Saharan Africa (54%), Latin America (13%) and South and Southeast Asia (13%).

Overall, 49% of scholarship recipients were female, 2% were transgender.

48% were male and 1% were non-binary or gender non-conforming.

Just over half of scholarship recipients (54%) were younger than 36 years.

The IAS supplied data connections and/or hardware to 235 scholarship recipients (36%) to enable their participation in the conference.

Figure 6: Scholarship recipients by region

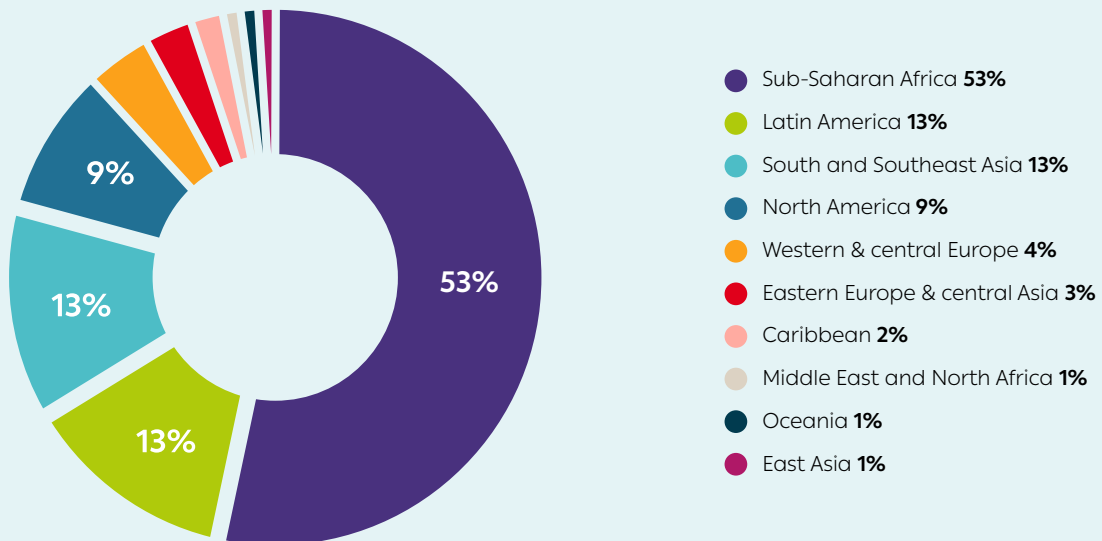
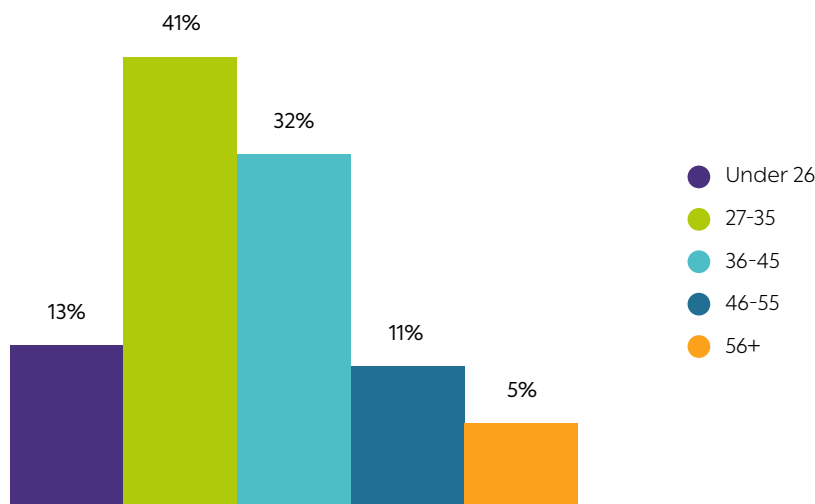
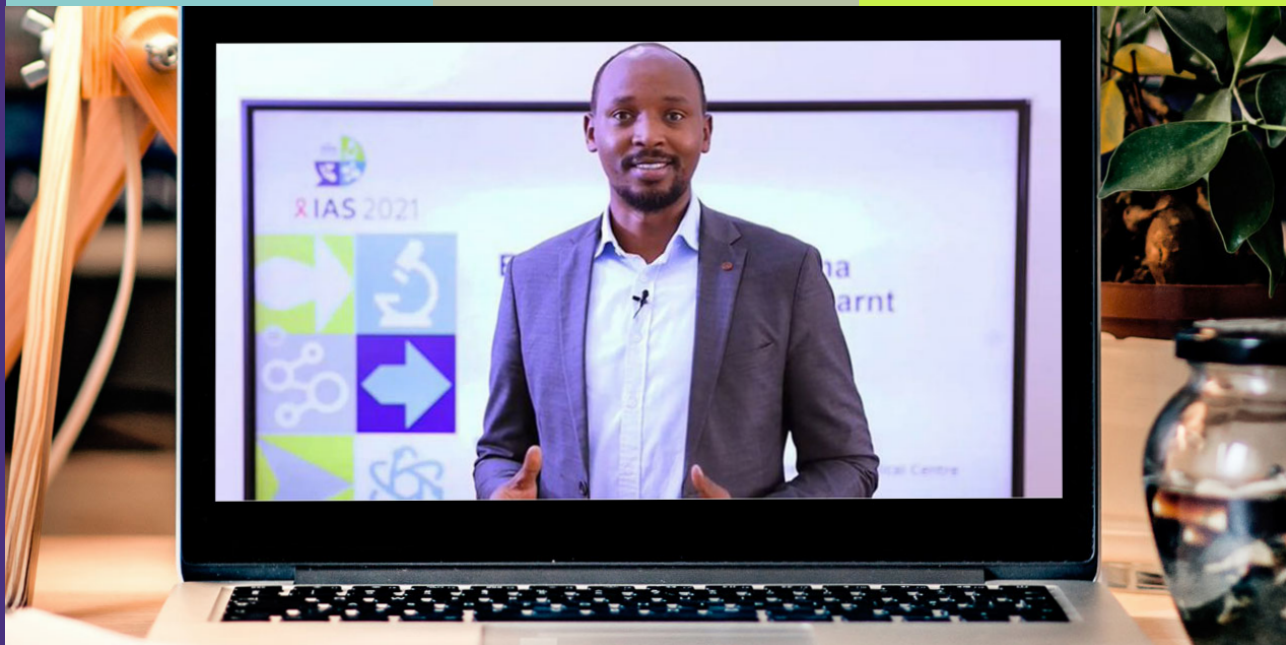
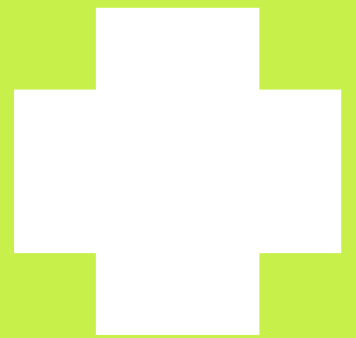
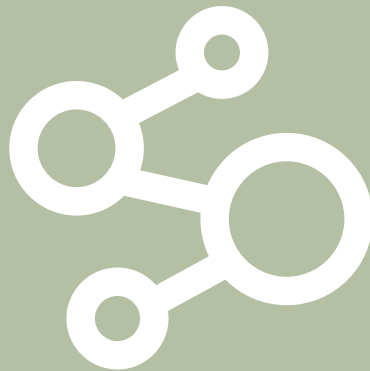


Figure 7: Scholarship recipients by age



# What was shared?

IAS 2021 took place in a year that saw major advances in HIV prevention options in the form of injectable pre-exposure prophylaxis (PrEP) and the dapivirine intravaginal ring. It was also a year of remarkable resilience of the HIV response in the face of the COVID-19 pandemic.



And 2021 will be remembered for the accelerating pace of extreme events precipitated by man-made climate change, including devastating floods just before IAS 2021 in the original host country of Germany. In a prime session, Renzo Guinto (PH Lab, The Philippines) highlighted the interconnections between the HIV pandemic and global climate change, noting that several of the countries with the greatest burden of HIV in southern Africa are also among the most

vulnerable to climate change [2]. Disruptions to livelihoods, nutrition, food security and health systems, caused by climate change, will worsen the impact of the HIV epidemic. We need to start thinking about a planetary health approach that sees the interconnections between climate, health and development challenges and works towards climate-smart, pandemic-resistant solutions, he told the conference.



# COVID-19 and the impact on HIV

## The HIV response

COVID-19 has posed an enormous challenge to the HIV response, leading to service disruptions and a decline in access to services. Data reported to the UNAIDS/WHO/UNICEF HIV services tracking tool showed that most but not all countries reported reductions of between 40% and 80% in HIV testing from March to December 2020 compared with baseline uptake in the first two months of the year [3]. In some countries, services rebounded by October 2020; in others, testing volumes remained low. Overall, evidence suggests that HIV treatment programmes did well in maintaining services despite tremendous challenges. Most countries did not experience reductions in the number of people on

antiretroviral therapy (ART). However, the rate of increase in the number of people starting ART slowed somewhat in 2020 [4].

Research presented at IAS 2021 shows that the HIV response has demonstrated resilience and the ability to adapt during the COVID-19 pandemic. A study of 1.83 million people receiving HIV treatment at sites supported by the US President's Emergency Plan for AIDS Relief (PEPFAR) in seven countries in sub-Saharan Africa found no significant increase in treatment interruptions from April to September 2020 compared with the first quarter of 2020 [5].

---

"These results are a testament to the ability of countries and programmes to quickly adapt to the pandemic, and we are hopeful that these policies will be maintained in the future as well."

Neha Mehta,  
US Centers for  
Disease Control  
and Prevention  
[6]



An analysis of service utilization among key populations in South Africa found that although testing, HIV case finding and ART initiation declined during the national lockdown from 26 March 2020, activity resumed as the lockdown eased. By September 2020, ART initiation exceeded projected levels at many sites among female sex workers, gay men and other men who have sex with men, and transgender people [7].

Although healthcare workers reported disruption to services at some sites from April to June 2020 in a study of seven primary health clinics in Uganda and

Kenya, 59% of those surveyed said that ART initiation and viral load testing had not been affected at their clinic. Furthermore, many clinics had introduced or expanded service innovations that reduced the need for clinic visits [8]. In India, service users reported satisfaction with the introduction of multi-month dispensing as a COVID-19 mitigation measure as it saved time and reduced exposure to COVID-19 risks; they also expressed a preference for community collection over household delivery of medication to reduce stigmatization [9].



Prospective modelling for the new Joint United Nations Programme on HIV and AIDS (UNAIDS) strategy projects that the effects of service disruptions will largely disappear by 2025 if the global HIV response is able to catch up to meeting targets. The bad news is that these disruptions could result in 120,000-290,000 more HIV acquisitions than expected in the next two years.

## COVID-19 and differentiated service delivery for HIV

COVID-19 has accelerated the transition to differentiated service delivery (DSD) for HIV and service integration in many settings, the conference heard. In South Africa, COVID-19 has led to the scale up of community-based ART refills along with refills for non-communicable diseases. The proportion of people with HIV, hypertension and/or diabetes obtaining commodity refills from community locations (known as external pick-up points, such as pharmacies, community pick-up services and lockers) increased from 36% in January 2020 to 56% in May 2021 [10].

In Ethiopia, after revision of qualifying criteria for multi-month dispensing, the proportion of people receiving six-month dispensing increased from 25% in October 2019 to 61% in March 2021 [11]. Multi-month dispensing was also made available to children and adolescents in response to COVID-19, with nearly half of those 15 years and younger receiving three to five months of ART refills in 12 countries by the end of September 2020 compared with just 32% in December 2019 [12].

“COVID-19 has made it clearer than ever that public health must meet people where they are, especially in times of adversity.”

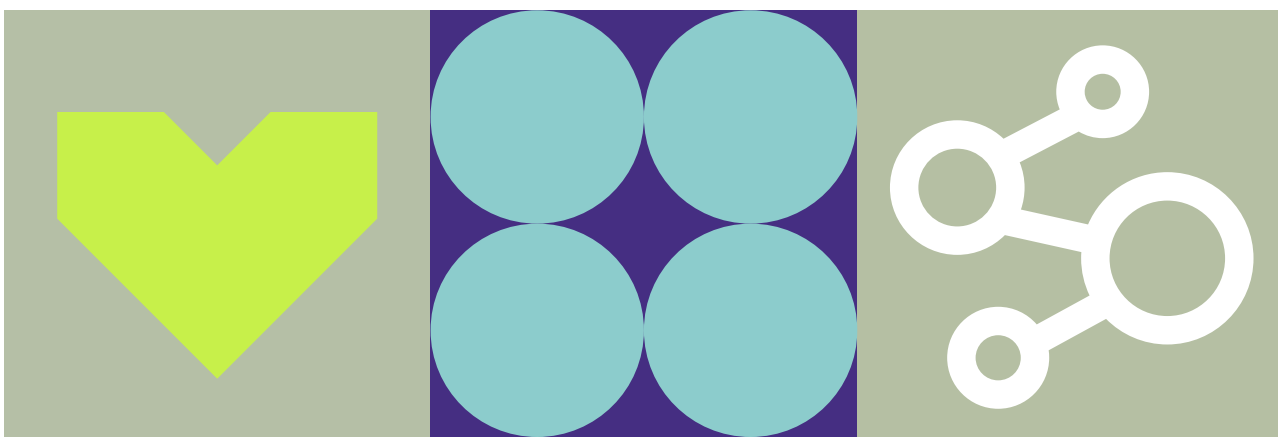
University, USA (Track D rapporteur) [13]

The COVID-19 pandemic has brought into focus the need to invest in health systems, disease surveillance, vaccine research and health security. The conference heard how funding for the HIV response has enabled strengthened health systems in lower-income countries to pivot rapidly to respond to the COVID-19 pandemic, for example, through use of HIV-related PCR laboratory capacity to test for SARS-CoV-2 [14]. The global architecture developed to combat HIV, TB and malaria has also been mobilized to respond to COVID-19. The Global Fund has awarded funding to 106 countries to reinforce COVID-19 actions and mitigate impacts on HIV, TB and malaria programmes, and the Medicines Patent Pool has extended its mandate to COVID-19 treatments and vaccine technologies.

“COVID-19 has raised the profile of global health and global health security funding.”

Charles B Holmes, Georgetown University, USA [15]

As well as exposing gaps in health systems – including a lack of personal protective equipment, critical care, oxygen and ventilation capacity – COVID-19 has also returned attention to gaps in local production of health commodities and access to medicines and vaccines.



## Impact of COVID-19 on people living with HIV

The COVID-19 pandemic has also highlighted the vulnerability of people living with HIV, especially those who are undiagnosed or not on fully suppressive ART. An analysis of 268,412 hospitalized people reported to the World Health Organization's (WHO's) Global Clinical Platform for COVID-19 showed that people living with HIV (n=15,522) were 13% more likely to be admitted to hospital with severe or critical COVID-19 after controlling for age, gender and co-morbidities than those not living with HIV [16]. People living with HIV were also 30% more likely than those not living with HIV to die after admission to hospital, independent of age, gender, severity at presentation and co-morbidity.

A study of 13,142 people living with HIV receiving care in the Spanish province of Catalonia found that hospitalization or

death from COVID-19 in people with HIV was more likely in those over 75 years old, people born outside Spain and those with multiple co-morbidities. CD4 count did not affect the risk of severe COVID-19 in people with suppressed viral load, but in people with detectable viral load, a CD4 count below 500 was associated with an increased risk of a severe outcome [17].

These findings underline the importance of ensuring that people living with HIV are diagnosed, linked to care and initiated on ART to minimize their risk of severe COVID-19 outcomes; they should also be prioritized in national vaccination programmes.

"The global community must do much more to bring COVID-19 vaccines to countries ... with high prevalence of HIV and other diseases."

IAS President and IAS 2021 International Co-Chair Adeeba Kamarulzaman [18]



# Treatment and cure

## New treatment options

IAS 2021 heard further evidence on long-acting antiretroviral agents. Two studies of a new first-in-class agent, the HIV capsid inhibitor, lenacapavir, showed that after an oral induction phase, six-monthly subcutaneous dosing of lenacapavir achieved high rates of viral suppression in people with multi-drug resistant HIV and in previously untreated people [19,20]. A study of the implementation of the injectable cabotegravir/rilpivirine regimen in the United States showed that the monthly or bimonthly regimen was acceptable and feasible in a high proportion of health settings. Initial concerns among healthcare providers about staff resources and keeping of appointments diminished as experience grew and staff reported that the greater frequency of clinic visits resulted in improved opportunities for health screening and support [21,22].

In a prime session, Jennifer Hoy (Monash University, Australia) explored the potential

for a paradigm shift in ART towards two-drug regimens or less frequent dosing. Although two-drug regimens have shown equivalent durability and tolerability to three-drug regimens in previously untreated and treatment-experienced populations, they remain unsuitable for use in settings with a high prevalence of hepatitis B or transmitted resistance to lamivudine or emtricitabine. Currently, there is a paucity of evidence on outcomes of two-drug regimens in pregnant women and people living with HIV and TB. Combined with evidence of inferior viral suppression among people with advanced HIV disease on two-drug regimens compared with three-drug regimens, it is not likely that two-drug regimens will be recommended for many people living with HIV in the immediate future. New agents and three-drug ART will still be needed for people with extensive treatment histories and/or contraindications to two-drug regimens or injectable ART [23].

## Basic science and cure research

IAS 2021 highlighted the complexity of mechanisms that promote persistence of the viral reservoir, including proliferation of HIV-infected cells [24] and host genetic factors [25]. A reservoir sub-study nested within the START study of early ART demonstrated that the HIV reservoir measured by HIV DNA was significantly lower in people with CD4 counts above 800 cells/mm<sup>3</sup> compared with lower CD4 strata, and HIV DNA levels were lower in women at all CD4 counts compared with men [26].

The conference also heard updates on the impact of biological sex and gender on HIV. Immune system genes important in the control of HIV, including TLR-7, are located on the X-chromosome and can evade X-chromosome inactivation, leading to higher gene dosage in women [27]. HIV is also affected by sex hormones: oestrogen

maintains HIV latency and modulates numerous immunological and virological parameters relevant to HIV cure research [28,29]. HIV research from basic science to clinical cohorts should consider sex and gender identity [30]. Mechanistic studies of HIV pathogenesis that differentiate by biological sex and gender are needed, together with greater attention to cohort characteristics and the hormonal milieu from which cells are sampled.

An animal study of two monoclonal antibodies targeting human proteins that permit viral persistence during ART showed that inhibition of PD-1 and IL-10 in rhesus macaques led to enhanced HIV control during analytic treatment interruption [31]. The findings offer proof of concept for gene therapy approaches designed to induce the production of IL-10 and PD-1 antibodies.

## Treatment for co-morbidities

IAS 2021 provided encouraging data on the treatment of several major co-morbidities affecting people living with HIV. Tuberculosis remains the most common cause of death in people living with HIV. Some regions with a high burden of HIV are also challenged by high rates of drug-resistant TB, notably in South Africa and eastern Europe. Treatment regimens for drug-resistant TB are lengthy, toxic and require the use of injectable drugs. The ZeNIX study demonstrated that a six-month course of the three-drug all-oral regimen, BPaL (bedaquiline, pretomanid and linezolid), was highly effective in treating highly drug-resistant and extremely drug-resistant tuberculosis [32].

*"The results of this study are very reassuring. With a reduction in the dose and/or duration of linezolid, we can still offer patients a high chance of cure in only six months."*

Francesca Conradie, principal investigator, ZeNix [33]

Cryptococcal meningitis is another major cause of death in people living with HIV in lower- and middle-income countries. Although WHO recommends intravenous induction treatment with amphotericin B as part of the treatment regimen for cryptococcal meningitis, it is neither feasible nor sustainable in many settings. At IAS 2021, results from the AMBITION-cm randomized study demonstrated that the use of a single high dose (10mg/kg) of liposomal amphotericin B (AmBisome) as part of the treatment regimen was non-inferior to the standard of care [34]. Access to the new regimen will depend on updating guidelines at global and national levels, as well as increasing product registration in countries where the burden of cryptococcal meningitis is high.

Hepatitis C is common in people living with HIV. Direct-acting antivirals can cure hepatitis C after a short course of treatment, and global targets for the elimination of hepatitis C by 2030 are for 80% of diagnosed people to be treated. Targets for micro-elimination are being set for populations with a high burden of hepatitis C, including people living with HIV. Researchers reported on progress towards micro-elimination in ATHENA, the national cohort of people receiving HIV care in the Netherlands [35]. Hepatitis C prevalence in the ATHENA cohort fell from approximately 5% before 2014 to 0.6% in 2019 due to unrestricted access to direct-acting antivirals. By the end of 2020, only 29 people with HIV were still living with diagnosed chronic hepatitis C in the Netherlands.

An evaluation of the hepatitis C cascade of care among people with HIV in the Australian state of New South Wales also showed strong progress towards elimination [36]. In both settings, universal access to hepatitis C treatment enabled high and rapid uptake of treatment.

But an observational cohort study of 22,340 people with HIV in Cambodia, Hong Kong, India, Indonesia, South Korea, Taiwan and Vietnam found low rates of screening for hepatitis B and C in 2010 and 2019 and suboptimal levels of treatment initiation in those with chronic viral hepatitis. Only 40% of those treated for hepatitis C underwent testing for sustained virologic response, indicating the need for affordable and accessible screening and confirmatory tests in the region to achieve elimination targets [37].

# Stigma, gender-based violence and equity

## Stigma

Stigma remains a major challenge for the HIV response, affecting willingness to access services, as well as quality of life for people living with and vulnerable to acquiring HIV. IAS 2021 presented new approaches to measuring stigma, as well as the role of communities in monitoring pervasive stigmatization within HIV services. Community data collection has the potential to improve services when

integrated with treatment cascade data [38]. A survey of treatment cascades in four African countries showed that viral non-suppression was strongly associated with a desire to hide one's HIV status [39]. Delayed treatment initiation was associated with the desire to hide one's HIV status and denial of medical care in the previous year due to one's HIV status [40].

"How will we know what we need to change or how to intervene on stigma? You have to hear from the recipients of care, the demand side of the story... You're not getting the full picture if you're not hearing from them."

Solange Baptiste, International Treatment Preparedness Coalition, South Africa [41]

Stigmatizing responses to prevention innovations, including PrEP and U=U (undetectable equals untransmittable), are also significant barriers to the adoption of evidence-based prevention interventions. In Thailand, negative public responses to the U=U message have been compounded by reluctance among healthcare providers to inform people living with HIV about zero risk of sexual transmission of HIV with effective treatment [42].



## Gender-based violence

Living free from sexual violence is a fundamental human right and also central to ensuring an effective HIV response.

The COVID-19 pandemic has led to an increase in sexual violence in Uganda. In data from Uganda, the number of cases of rape reported increased in the first six months of the pandemic and the odds of receiving post-exposure prophylaxis fell by 79%, suggesting an increased risk of HIV exposure for girls and women during the COVID-19 pandemic [43].

Research in Brazil showed that gender-based violence affects viral suppression in transgender women living with HIV. In transgender women who initiated ART, a lifetime history of sexual violence was associated with 58% lower odds of viral suppression than those without a history of sexual violence [44]. The study findings suggest that interventions seeking to improve ART adherence should assess and address experiences of gender-based violence in this population.

## Equity

The science presented at IAS 2021 also demonstrated the importance of targeted approaches tailored to local contexts to close gaps and address inequalities. A cost-effectiveness analysis of HIV prevention and treatment interventions in the United States examined how scaling up services by targeting inequalities in service uptake would achieve better health outcomes and reduce costs. In this model, services were scaled up in proportion to the burden of new HIV diagnoses reported in different racial or ethnic groups, rather than in proportion with current use [45]. The model projected reduced incidence and costs, together with gains in quality-adjusted life-years when compared with proportional scale up.

A meta-analysis of 130 studies reporting diagnosis, treatment initiation or viral suppression outcomes in sub-Saharan Africa demonstrated consistently poorer outcomes for men at each stage of the treatment cascade [46]. A meta-synthesis of qualitative studies examining barriers to male engagement in HIV care showed that men are better engaged in HIV care when interventions improve trust in the health system, provide affordable and convenient care, and fundamentally transform constructs of masculinity [47].



# Prevention: PrEP, STIs and HIV vaccines

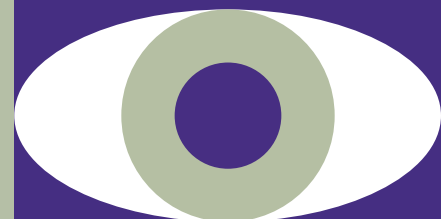
## The impact of COVID-19 on HIV prevention

COVID-19 has accelerated trends towards simplified, differentiated prevention interventions. An IAS 2021 symposium, "Pivoting HIV prevention during a parallel pandemic", explored the impact of the COVID-19 pandemic on efforts to achieve the UN Fast-Track treatment and prevention targets and adaptations in prevention services during the pandemic. The world was already off course to achieving the 2020 Fast-Track target of a 75% reduction in new HIV acquisitions since 2010. COVID-19 restrictions, such as lockdowns, have affected testing activity: 16 of 19 countries surveyed by UNAIDS reported sustained disruptions to testing services in 2020 [48]. Similar disruptions were observed in voluntary male medical circumcision services and prevention services for sex workers.

The extent of adaptation has varied between countries and prevention interventions. A survey of 28 UNAIDS Global HIV Prevention Coalition HIV high-burden countries in November 2020 found that while multi-month PrEP and HIV treatment dispensing had been widely adopted and outreach to young women and key populations was safely sustained, harm reduction targets for needle and syringe programmes and provision of

takeaway opioid substitution treatment had been achieved in few countries [49]. The survey found that community-based organizations have played a major role in innovating and continuing services during the COVID-19 pandemic.

The COVID-19 pandemic has further stimulated growth of differentiated PrEP delivery [50]. Online engagement, mobile clinics, home delivery, involvement of key populations in PrEP delivery and telemedicine have begun to shift the provision of PrEP from facility-based models, demonstrating feasibility and acceptability of new models while increasing uptake. Differentiated PrEP delivery will be further supported by normative guidance that articulates greater use of lay providers, HIV self-testing and sexually transmitted infection (STI) self-sampling, as well as the development of a wider range of PrEP options.





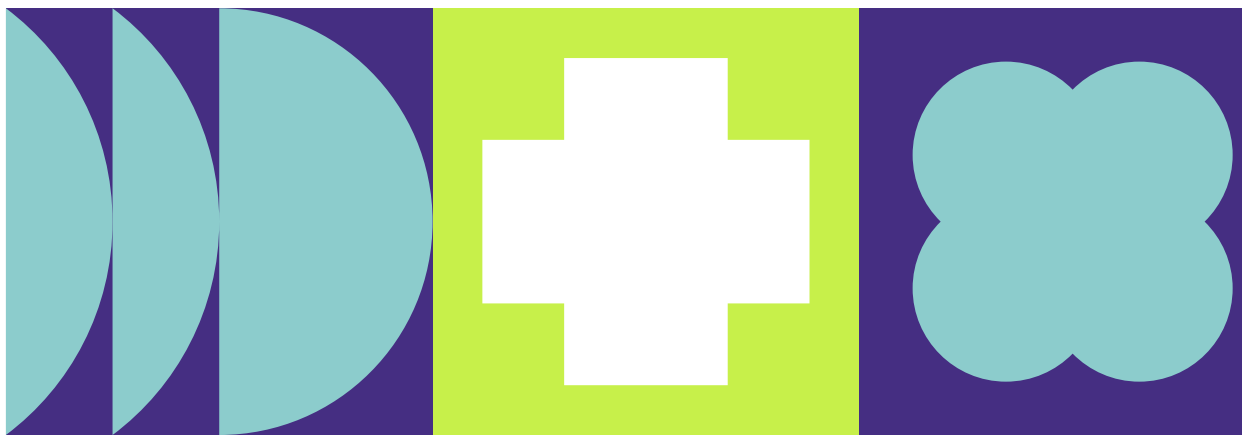
## PrEP

The conference featured numerous reports on PrEP uptake and outcomes in Asia, Latin America and sub-Saharan Africa, demonstrating the extent of PrEP roll out despite COVID-19. The China Real-world Orally intake PrEP (CROPrEP) observational study showed that PrEP use by men who have sex with men was associated with an 87% reduction in HIV incidence after 12 months of follow up compared with men who declined the offer of PrEP [51]. The findings of the CROPrEP study led to a recommendation for PrEP implementation in China in 2020. The ImPrEP study, a large demonstration study of PrEP uptake, adherence and effectiveness in Brazil, Mexico and Peru, reported outcomes in 10,410 participants. HIV incidence was low in participants in Brazil and Mexico, but the study observed higher incidence in Peru (2.42%) [52]. Seroconversion was associated with younger age and lower adherence.

For transgender populations and their healthcare providers, reassurance that oral PrEP does not interact with gender-affirming hormone therapy can support adherence and confirm the potential for prevention effectiveness, encouraging uptake and provision of PrEP. A study in transgender women in Brazil demonstrated that tenofovir and emtricitabine did not reduce estradiol exposure, although spironolactone exposure fell slightly [53]. Another study showed that after an early increase in tenofovir and emtricitabine levels in transgender women receiving hormone therapy, drug concentrations matched those in participants taking PrEP without gender-affirming hormone therapy after Week 30 [54].

“Our results reassure that oral PrEP and feminizing hormone therapy can be used concomitantly.”

Vitoria Berg Cattani,  
Evandro Chagas  
National Institute of  
Infectious Diseases  
(INI)-FIOCRUZ, Brazil  
[55]



## Long-acting PrEP products

In January 2021, WHO recommended the dapivirine intravaginal ring as an additional prevention option for women at substantial risk of acquiring HIV [56].

Adolescent girls and young women are a priority population for HIV prevention in sub-Saharan Africa. The MTN-034 (REACH) study of the safety, adherence and acceptability of these products in 16- to 21-year-old girls and young women in South Africa, Uganda and Zimbabwe showed that high adherence was more common in ring users than PrEP users. Acceptability of the dapivirine ring was also higher than oral PrEP in the study population [57]. MTN-034 demonstrated that the dapivirine vaginal ring is a promising HIV prevention option for adolescent girls and young women in sub-Saharan Africa.



"A lesson from [MTN-034] is that even though people say, 'young women won't use these products,' the capacity for people to choose a product that fits in their lives is going to be really important."

Sharon Hillier, University of Pittsburgh

Longer-acting PrEP products are in development to address adherence challenges in diverse populations. IAS 2021 heard 24-week safety and pharmacokinetic data from a Phase 2a study of the nucleoside strand transfer inhibitor, islatravir, as PrEP [58]. The study demonstrated that monthly oral dosing maintained drug levels above the threshold for preventing HIV acquisition for at least eight weeks after the last dose. Islatravir was well tolerated with no serious drug-related adverse events.

## The prevention challenges of STIs and chemsex

The conference also debated approaches to the management of STIs in PrEP users. Although STI diagnoses have increased in PrEP users, there is some evidence that STIs are highly concentrated in specific groups of PrEP users [59]. Several sessions emphasized the importance of regular STI screening and treatment as a core feature of PrEP programmes. In a prime session, Deborah Williamson (University of Melbourne, Australia) highlighted the growing burden of antimicrobial-resistant STIs, especially in gay men and other men who have sex with men [60]. Speakers stressed the importance of improving service access and diagnosis, as well as reducing empirical azithromycin use and avoiding its use in gonorrhoea treatment, to limit the emergence of resistance [61].

**“Adherence to visit follow-ups and STI screening needs to have the same emphasis as adherence to PrEP.”**

Bernhard Haas, Austrian AIDS Society [62]

In a prime session review of sexualized drug use and HIV, Stephane Wen-Wei Ku (Taipei City Hospital, Taiwan) reviewed cross-sectional data from Asia on chemsex in gay men and other men who have sex with men. The data showed that 9% to 17% of gay men and other men who have sex with men reported using drugs in a sexual context in studies conducted from 2013 to 2018. Integration of harm reduction for sexualized drug use into sexual health services is urgently needed to address the harms associated with sexualized drug use, including the increased risk of hepatitis C from drug injection and group sex. Culturally sensitive needle and syringe programmes, harm reduction messaging, PrEP and STI screening, as well as non-stigmatizing discussion of drug use, are key components

of chemsex harm reduction. Further research is needed to develop evidence-based harm reduction interventions for sexualized drug use [63].

## Vaccines

The rapid development of vaccines for COVID-19 has returned attention to the challenges inherent in HIV vaccine development. Pepe Alcamí (Hospital Clinic, Spain) emphasized that developing a vaccine against a chronic infection is inherently more difficult than against an acute infection like COVID-19. Further, SARS-CoV-2 vaccines cannot provide a model for HIV vaccine development until HIV immunogens that elicit protective immunity are identified [64].

However, the experience of HIV vaccine development has been critical for the rapid testing of SARS-CoV-2 vaccines and monoclonal antibody treatments. Infrastructure and techniques developed to support the discovery and testing of HIV vaccines have enabled SARS-CoV-2 vaccine candidates to move into human trials with unprecedented speed. Moderna's mRNA vaccine platform was already being explored as a possible mechanism for delivering an HIV vaccine, while work on broadly neutralizing antibodies (bNAbs) for HIV was critical for the development of monoclonal antibodies as treatments for severe COVID-19 [65].

Marina Caskey (The Rockefeller University, US) explained that developments in COVID-19 antibody therapeutics in the areas of discovery, cloning, characterization of antibody activity and engineering of products will propel the further development of bNAbs for use in HIV prevention and treatment.

# How was it covered?

IAS 2021 generated 492 news media stories, including 316 original articles and substantial syndicated pickup. Top-tier media from the US, UK, France and Germany covered the conference, generating significant trade media coverage.



HIV science drove media coverage. This included the top story presented in the official press conference for IAS 2021: WHO's report on COVID-19 risk for people living with HIV. Studies on the vaginal ring, oral PrEP safety during pregnancy, oral islatravir and subcutaneous lenacapavir also generated significant media coverage.

Beyond breaking science, German media widely covered German Chancellor Angela Merkel's remarks during the opening session.

- Covid Is Especially Risky for People With H.I.V., Large Study Finds

New York Times

- Merck Posts Positive Safety Data for Investigational HIV Drug

Wall Street Journal

- Highly drug-resistant TB treatment trial shows reduced side effects

Devex

- HIV Acquisition on PrEP Rare, Some Drug Resistance in First Large Study

Medscape

- Dapivirine ring symbol of hope for women in HIV fight

The Herald (Zimbabwe)

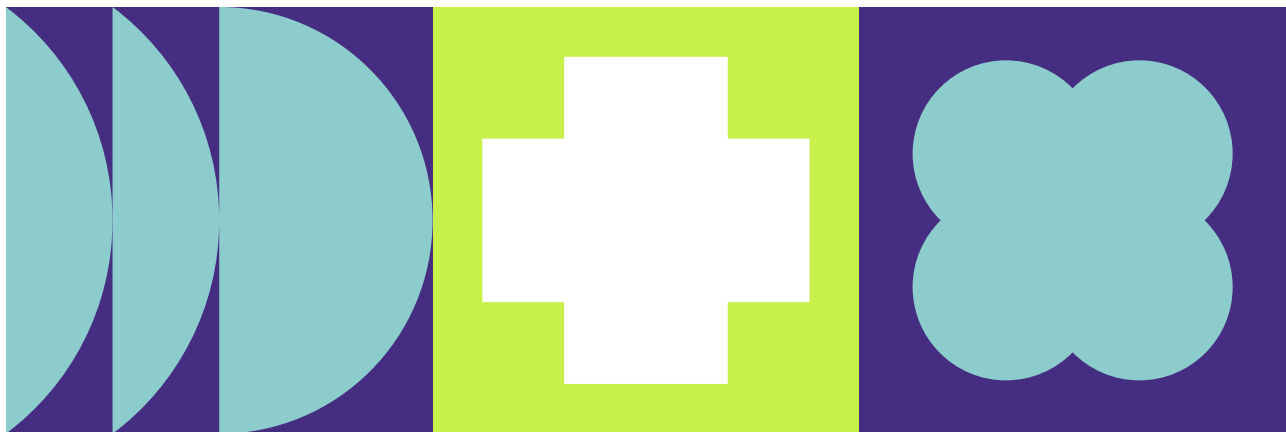
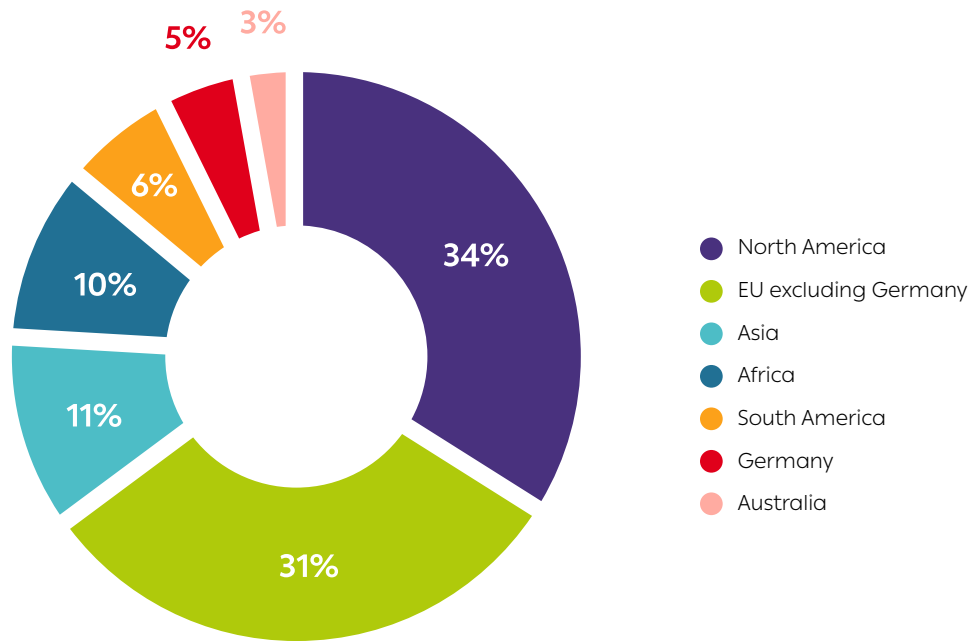


Figure 8: Media coverage by region



## Digital highlights



**10.1 million**

people reached through 3,616 social media and blog posts



**698,278 impressions**

generated from 401 official IAS 2021 tweets, including over 17,844 engagements, a 132% increase on IAS 2019



**Record 9.1% click rate**

of IAS 2021 Daily Delegate emails, up from 6.1% in IAS 2016



**61,278 visits**

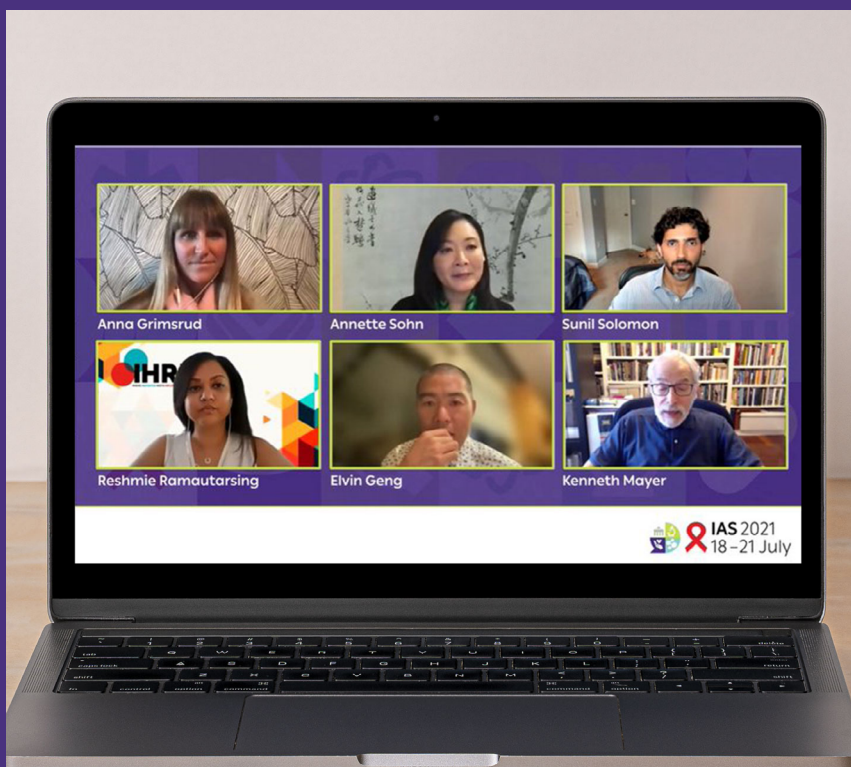
to the IAS 2021 website throughout the conference, a 180% increase on IAS 2019



**413 hours**

of IAS YouTube videos watched throughout the conference

# How did it go?



## Key informant interviews

Fourteen stakeholders (including the conference co-chairs, track co-chairs, sponsors, partners, community members and other civil society representatives) provided in-depth feedback on the scientific content of the conference, organization, expected outcomes and recommendations for maximizing impact.

## Focus group and in-depth interviews

A focus group and in-depth interviews with 10 early-career researchers and scholarship recipients provided feedback on the conference platform, networking tools, promoting wider participation and scientific content.

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## Online delegate survey

Of the 6,189 delegates, 1,469 (24%) responded to an online survey on 19 topics. The data and quotations presented here are all drawn from the survey and key informant interviews. The quotations used have been minimally edited for clarity and brevity where needed.

Survey respondents were broadly representative of all delegates regarding region, age, gender and organizational affiliation:

- Responses were received from 103 of the 135 countries represented at the conference. Respondents were more likely to be from sub-Saharan Africa (26%) and Latin America (24%) and less likely to be from North America (11%) than conference delegates as a whole.
- Of survey respondents who shared their gender, 50% identified as female (including six trans females), 46% identified as male (including five trans males), 1% identified as gender non-conforming or non-binary, and 2% declined to answer the question.
- Very few young people (under 26 years) (7%) completed the delegate survey. Most were 26-55 years old (75%), with the highest percentage (29%) aged 36-45 years.
- The majority of respondents were physicians (46%), other healthcare workers (10%) or worked in academia (15%).
- Thirty-five percent of respondents identified as members of at least one key or vulnerable population.

Just over half of the respondents (52%) have been working in their field for more than 10 years, 22% for 6-10 years, and 19% for 2-5 years. Only 6% were newcomers (0-2 years in their field).

Just under half of the survey respondents (47%) said that this was the first time they had participated in an IAS Conference on HIV Science.



Figure 9: Delegates and survey respondents by age

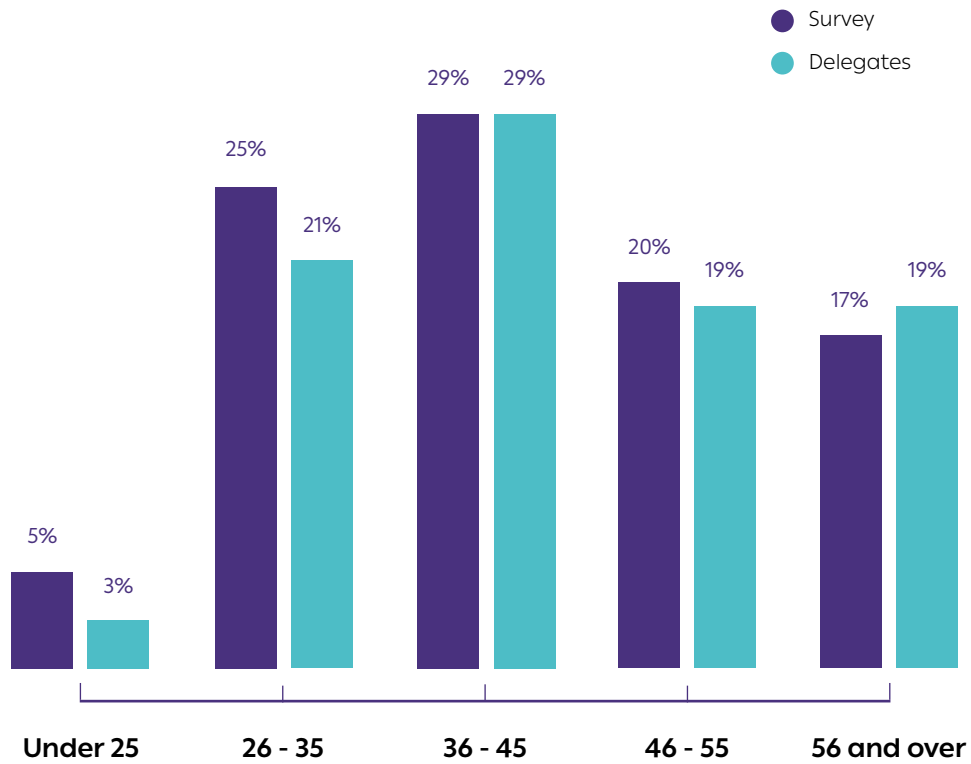
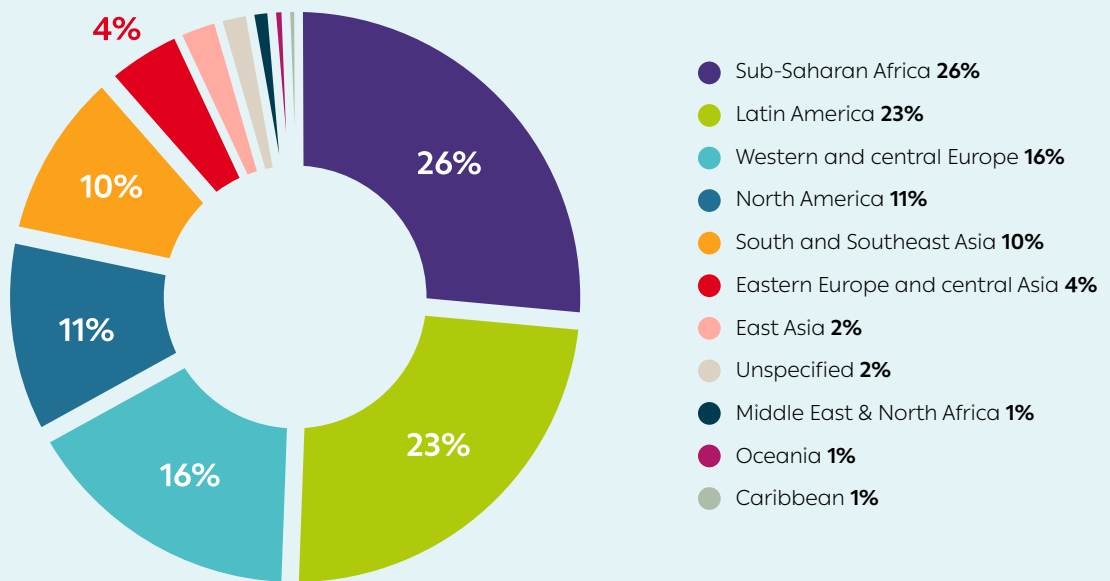


Figure 10: Delegate survey respondents by region



# What did people get out of it?

## 1. New information on HIV science

Delegates at IAS 2021 were highly satisfied with the wide range of science presented at the conference. Overall, 92% of survey respondents reported satisfaction with the knowledge they acquired from IAS 2021, including updates regarding recent developments in the field. A total of 97% reported that they had learnt about the latest research findings in HIV prevention, support, treatment and care, including progress towards a vaccine and a cure, and 90% agreed that they had learnt about new research to a great or moderate extent at the conference.

Survey respondents were most likely to cite COVID-19 and HIV (94%), co-infections and co-morbidities (91%), new developments in ART (89%) and PrEP (89%) as the subjects they gained new information on at IAS 2021.

Survey respondents most frequently mentioned new developments in PrEP and long-acting antiretroviral products as key take-home messages in their qualitative comments on the conference. Almost all key informants highlighted research on experimental long-acting treatment and prevention products, too.

"Amazing progress in the field of HIV prevention, especially with regards to PrEP. More choices for women and I am mostly excited about the vaginal ring as an option for PrEP."

Survey respondent

## 2. New knowledge on COVID-19 and HIV

Survey respondents were more likely to say that they had learnt a lot about COVID-19 than about any other topic at IAS 2021. A total of 62% said that they gained a lot of new information or insight about COVID-19 and 32% said that they gained some; 85% said that they gained some or a lot of new information about changes in service delivery due to COVID-19.

Key informants highlighted studies that showed evidence of resilience in HIV service provision during the COVID-19 pandemic. They also

emphasized the importance of data on the elevated risk of COVID-19 and risk factors for severe COVID-19 outcomes in people with HIV.

Delegates also reported new awareness of how HIV infrastructure and science could contribute to innovations in response to emerging and established health threats, based on lessons from the SARS-CoV-2 pandemic; 88% said that they had gained new information and insights on this topic from IAS 2021.

"With COVID, so much has changed – the way we engage with the communities we work with and our colleagues, the way new technologies are being studied and introduced for treatment, diagnosis and prevention, and everything is happening at such a rapid rate. Keeping up to speed with those changes and updates is critical – and attending IAS 2021 has been a great way to do just that."

Survey respondent

### 3. Enhanced understanding of differentiated service delivery

Survey respondents showed strong awareness of the stimulus that the COVID-19 pandemic has given to DSD for HIV care and prevention; 80% of respondents said that they had gained some or a lot of new information about DSD at IAS 2021.

Survey respondents emphasized the importance of learning more about person-centred care and the integration of services at IAS 2021. They

also identified telemedicine, digital services and self-testing as important elements of future differentiated services as a result of attending IAS 2021.

Key informants stressed the broad range of sessions and data on DSD as a key strength of IAS 2021.

"The COVID-19 pandemic has taught us a major lesson on the effectiveness of various differentiated approaches to HIV management, which we need to continue implementing as we fight to end the HIV epidemic."

Survey respondent

"Service delivery should meet the needs of recipients, and evidence-based research can improve the way we deliver services. COVID-19 has unleashed innovative ideas in HIV service delivery."

Survey respondent

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### 4. Greater awareness of how to combat stigma and discrimination

Survey respondents frequently mentioned the need to combat stigma and discrimination as a take-home message from IAS 2021. Physicians and healthcare workers identified the need to adapt services to reduce stigmatization; 81% of survey respondents said that they gained some or a lot of new information and insight into stigma and discrimination against people living with HIV at IAS 2021.

IAS 2021 enhanced understanding of the range of barriers to services encountered by people living with HIV and key populations. Almost all survey respondents (95%) agreed that they had learnt about personal, social and structural barriers to health and other services for people living with HIV, key populations and other vulnerable communities.

"[I gained] improved knowledge on how to go about the conduct of the advocacy on stigmatization of persons living with HIV."

Survey respondent

"I appreciated the strong focus on community engagement, stigma and discrimination this year."

Survey respondent

## 5. Community engagement

A total of 81% of delegates reported that they had gained new information on meaningful community engagement in research and implementation. Survey respondents stressed the importance of community engagement in their take-home messages from the conference more frequently than any topic except COVID-19.

Delegates identified a broad spectrum of lessons learnt from the conference, ranging from community consultation on implementation to monitoring of service delivery by the community.

"Community engagement is key. There is nothing we can implement for communities without involving them."

Survey respondent

"The science of HIV should be centred around the community. There should be an integration with the clients who access [services]. Programmes on HIV can succeed or fail. It all depends on how the community perceives it. Community perception is key, and receptiveness towards an intervention is very important."

Survey respondent

## 6. New perspectives on HIV cure research

Overall, 87% of survey respondents said that they had gained new knowledge on basic science and 84% on HIV reservoirs and cure. Prime sessions on HIV reservoirs and HIV vaccines and immunotherapy were among the 10 most viewed conference sessions.

value of integrating the sessions of the HIV Cure & Gene Therapy Forum into the overall conference programme; integration enabled a broader range of delegates to learn about HIV cure research.

Survey respondents drew particular attention to conference sessions on gene therapy approaches to HIV cure as a source of new knowledge on HIV cure research. Key informants stressed the

Numerous survey respondents commented that what they learnt at IAS 2021 made them feel more optimistic about the prospects for an eventual cure for HIV.

"Genetic editing as a tool for HIV cure is a very promising and exciting field."

Survey respondent

"A cure for HIV using gene therapy seems more plausible than I previously thought!"

Survey respondent

# The virtual conference experience

During IAS 2021, there were 4,927 unique connections to the conference platform and 58,000 total views, including just over 13,700 views of satellite sessions. There were 26,000 e-poster viewings on the conference platform.

During the post-conference on-demand period for registered delegates (22 July to 17 August), there were 2,035 unique connections to the conference platform and 17,000 on-demand views of conference sessions. Registered delegates viewed 16,690 satellite sessions on-demand.

The Berlin Hub was an integral part of IAS 2021. It featured live conference sessions programmed by the local partner, the German AIDS Society (DAIG). Due to COVID-19 restrictions, participation was limited to speakers and delegates from Germany and neighbouring countries. Berlin Hub sessions

included a well-received debate on the rise in STIs since the introduction of PrEP and symposia on next-generation HIV vaccines and COVID-19 vaccines.

The online exhibition featured 16 virtual booths, including the IAS booth and booths for pharmaceutical and diagnostic companies, NGOs and the International Conference on AIDS and STIs in Africa (ICASA) 2021. Some 1,395 participants visited the IAS 2021 virtual exhibition during the conference, with 228 further unique visits during the on-demand period.



## Conference platform experience

IAS 2021 was delivered through a new online platform designed to enhance the user experience of the conference. Users reported high levels of satisfaction with the conference platform: 80% found navigation on the platform easy or very easy; 82% reported that the online programme was easy to use, and 75% found it easy to use the platform to ask questions during live sessions.

Key informant and in-depth delegate interviews revealed that even when users found the platform quite easy to use, they wanted to minimize the number of steps needed to find and view conference content.

The uptake of networking features on the conference platform varied according to function. Whereas more than 80% of delegates used the delegate profile search function and session question and answers function, survey respondents reported less use of the group chat (49% did not use), one-to-one video meetings (54% did not use) and chat with exhibitors (57% did not use). The conference platform enabled delegates to ask 1,136 questions during interactive sessions.

Key informant and in-depth delegate interviews indicate that delegates were either unaware of some networking features or unable to take advantage of them due to time zone differences or because they used the on-demand mode to view sessions.

## Innovations in conference format

Survey respondents and interviewees welcomed innovations in conference session formats.

Key informants and in-depth interviewees valued the longer discussion period after oral abstract presentations and liked the interview segment after prime session presentations. Live prime sessions were the most highly rated sessions at IAS 2021; 88% of survey respondents expressed satisfaction with these sessions, and five prime sessions were among the 10 most-viewed sessions of the conference.

*"The interviews by experts after the prime presentation really helped contextualize and expand on the presentations. It's an example of being able to do something innovative as a result of going online that maybe we wouldn't have tried in a live conference."*

Key informant

Key informants also valued debates and multiple key informants and in-depth interviewees identified the debate on STIs in the context of PrEP as one of their conference highlights.

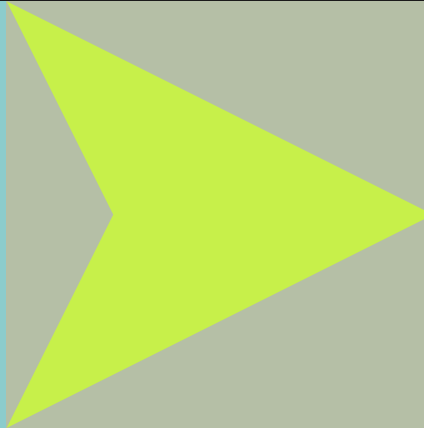
*"We need to be airing controversies and hearing differences of opinion."*

Key informant

Meet the Expert sessions, another format innovation at IAS 2021, gave delegates the opportunity to take part in six small, focused discussions with prime session presenters or other experts; 69% of survey respondents said they were satisfied with this session format.

Although the largely digital format of IAS 2021 enabled many people to take part in the conference for the first time, a majority of survey respondents (71%) will always prefer to attend future conferences in-person. Survey respondents and in-depth interviewees frequently cited the desire to network and develop collaborations in-person as reasons that they hoped for an in-person conference again.

# Will it make a difference?



## Impact on participants' work

Survey respondents expected that IAS 2021 would have an impact on their work in several ways. Overall, 64% agreed that IAS 2021 would improve their ability to engage in the HIV response, 32% thought that it would lead to changes in the way they worked, and 19% anticipated a change in the focus of their organization's work as a result of IAS 2021.

A total of 31% expected to develop new projects or activities due to IAS 2021, and 27% expected that the conference would lead to new or strengthened partnerships and collaborations.

Delegates expected to share what they had learnt with others. In all, 32% would use what they had learnt at the conference to build capacity within their organization or network, through training or the development of new guidelines or resources, and 61% planned to share what they had learnt through presentations to colleagues or dissemination of materials.

## Impact on policy and programming

Key informants anticipated that lessons shared from service adjustments during the COVID-19 pandemic would be especially influential in shaping the future of HIV service delivery. They drew attention to the evidence regarding the successful implementation of multi-month dispensing and concluded that it was likely to influence policy in settings where it had not been adopted yet.

In qualitative responses, survey respondents frequently remarked on the need for adaptation of programming in response to new evidence on differentiated service delivery during the COVID-19 pandemic.

A total of 27% of survey respondents expected that participation in IAS 2021 would strengthen their advocacy or policy work. The same proportion expected that they would use what they learnt at the conference to raise awareness among the community, policy makers and scientific leaders.

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"IAS 2021 underscored the need to manage both pandemics; thus, the need to urgently support countries to scale up adaptations to continue services while protecting the staff and clients from COVID."

Survey  
respondent



# Conclusions: Did we achieve our objectives?



# Objective 1

Accelerate basic science and clinical innovation for the development and application of person-centred, precision medicine for HIV, co-infections and co-morbidities and progress towards a vaccine and cure.

Overall, 89% of survey respondents agreed that the conference had met this objective; 98% agreed that they had learnt about the latest research findings in HIV prevention, support, treatment and care, including progress towards a vaccine and a cure.

Key informants acknowledged the wide range of high-quality science presented at IAS 2021 and commented on the success of the meeting in attracting a large number of abstract submissions.

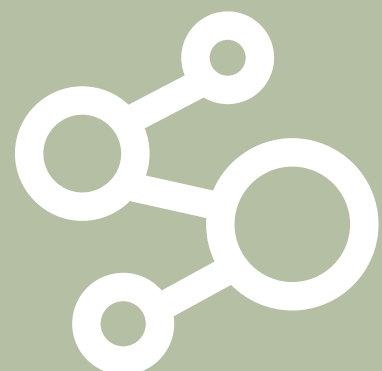
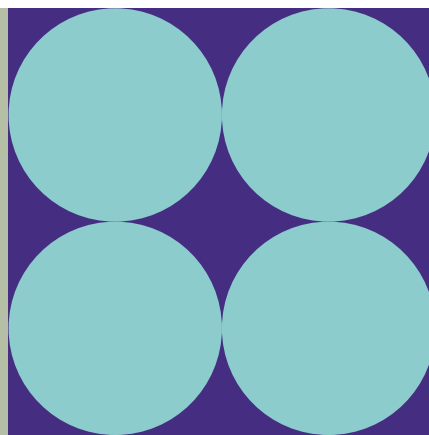
Key informants drew attention to studies on new delivery methods for PrEP, especially evidence of the use and acceptability of the dapivirine intravaginal ring in adolescent girls and young women. They emphasized the broadening range of prevention options as evidence of progress in person-centred prevention. In their survey responses, delegates frequently emphasized innovation, choice and person-centred care as important messages from IAS 2021.

"The more diverse options are the better; in terms of testing tools, prevention methods, and also the treatment of HIV; this will expand accessibility, affordability, and convenience for those in need of HIV services, which in turn increases adherence and quality of life."

Survey respondent

"I was so pleased to see the dapivirine ring results – they show us that when choice is offered, adherence will follow."

Key informant



# Objective 2

Advance interdisciplinary collaboration in clinical research to improve integrated and holistic care across all life stages for HIV, co-infections and co-morbidities, including non-communicable diseases.

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A total of 69% of survey respondents agreed that the conference met this objective. Survey respondents reported high levels of satisfaction with the knowledge they gained at IAS 2021.

Although more than half (53%) of survey respondents reported satisfaction with the networking and partnership opportunities offered by IAS 2021, fewer (28%) anticipated that they would develop new collaborations or strengthen existing ones as a result of attending IAS 2021.

Both key informants and survey respondents saw opportunities for networking and collaboration as key benefits of in-person conference attendance and hoped for a return to a live conference format by the time IAS 2023, the 12th IAS Conference on HIV Science, takes place.

"We need to capitalize on creating partnerships and collaborations so that we provide services in a holistic manner."

Survey respondent

"Science needs a rethink away from competition to large well-funded collaborations of communities and teams of multidisciplinary researchers to work on BIG problems."

Survey respondent

"My take-home message is that collaboration is the next ball game; you can never be 'self-contained' in the fight against HIV. Partnerships and networks are key."

Survey respondent

# Objective 3

Learn from the SARS-CoV-2 pandemic to further explore ways in which HIV science interlinks with and contributes to innovations in response to emerging pandemics and established infectious diseases, such as tuberculosis and viral hepatitis.

Overall, 87% of survey respondents agreed that they had learnt how HIV science could contribute to innovations in response to emerging and established health threats, based on lessons from the SARS-CoV-2 pandemic.

Key informants frequently cited changes in service delivery due to the pandemic and new information on the vulnerability of people living with HIV to COVID-19 as the scientific topics at IAS 2021 with the greatest implications for programming. Survey respondents frequently commented on the implications of COVID-19 for future HIV service delivery too, emphasizing the importance of person-centred services.

"COVID-19 has forced the issue of differentiated service delivery to the top of the agenda, not just for HIV but other disease areas too, especially non-communicable diseases. What we are learning about service reconfiguration and person-centred services might have taken us 10 years without COVID."

Key informant

"The experiences with COVID are highlighting inequity in healthcare that has been impacting HIV since the beginning of the epidemic but may lead to a beneficial change for people living with HIV."

Survey respondent

"COVID-19 has disrupted service delivery, but also caused programmes to pivot in their models of care delivery and develop novel approaches, which will likely outlast the COVID-19 pandemic."

Survey respondent

# Objective 4

Strengthen core components of the implementation science agenda across the HIV prevention-to-care cascade, including approaches for meaningful community engagement and resourcing health systems.

Overall, 79% of survey respondents agreed that this objective had been met. A total of 96% of survey respondents said that they learnt about the remaining knowledge gaps in implementation science, and 94% learnt about approaches to meaningful community engagement in research and implementation.

Key informants stressed the strength and the breadth of Track D (implementation science) at IAS 2021. Implementation science is a distinctive feature of the IAS Conference on HIV Science, key informants agreed, and this was reflected in the volume of abstract submissions to Track D in 2021.

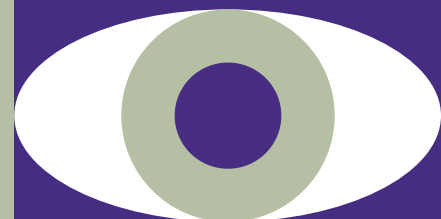
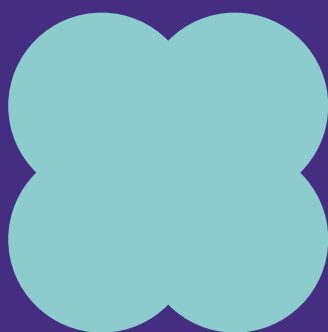
Survey respondents and key informants identified studies on community engagement in research and implementation as especially important features of the conference; 38% of respondents said that what they learnt at IAS 2021 would improve their ability to engage with communities living with or affected by HIV in their work.

"Collaboration with the community really stood out for me."

Survey respondent

"We continue to build the strength of the conference in implementation science. For me, that's what makes the IAS conference distinctive."

Key informant



# Objective 5

Highlight human rights research to reduce the personal, social and structural barriers to health and other services for people living with HIV, key populations and other vulnerable communities.

A total of 92% of survey respondents agreed that this objective had been met, and 87% said that they had learnt about approaches to address personal, social and structural barriers to health and other services for people living with HIV, key populations and other vulnerable communities.

Asked about their take-home message from IAS 2021, survey respondents frequently referred to the importance of addressing barriers to prevention and care services, especially stigma and discrimination. Respondents also showed awareness of the need to consider how their own professional practice might contribute to stigmatization.

"Follow the science. Then tailor all products and services to meet the needs of the community and make them affordable and accessible to all by removing the barriers of stigma, discrimination and inequalities."

Survey respondent

"My take-home message this year is 'work on barriers' and 'leave no one behind'."

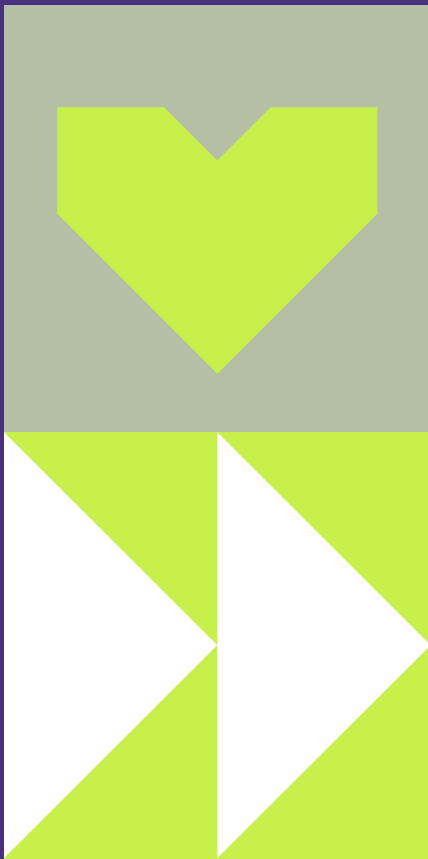
Survey respondent

"The range of research and presentations on stigma, measuring stigma and addressing stigma all made me feel that this topic is at last getting the attention it deserves, as a barrier in our programmes."

Key informant



# How can we do better next time?



## Take a hard look at progress towards global targets and how to get back on track after COVID-19

There was a strong feeling among key informants that AIDS 2022, the 24th International AIDS Conference, and IAS 2023 must take a hard look at where the HIV response is falling short and why, especially in the light of COVID-19 and failure to meet the 2020 interim prevention and treatment targets. Conferences must articulate solutions – or offer space to debate solutions.

## Pay attention to co-morbidities and ageing

Asked which topics they wanted to see covered at future IAS conferences, survey respondents identified one area ahead of all others: the management of co-morbidities and ageing in people with HIV. Seven of the 20 most-viewed posters at IAS 2021 addressed weight gain or other metabolic complications of ART, indicating the level of interest in co-morbidities. Optimizing screening and care for non-communicable diseases, especially cardiovascular disease and diabetes, were major concerns for healthcare professionals. They wanted to learn more about the complexities of managing non-communicable diseases in people living with HIV. Key informants identified viral hepatitis elimination in lower- and middle-income settings in people living with HIV as a topic they would like to see addressed more extensively at IAS 2023.

## How are we implementing long-acting treatment and prevention products?

Some key informants stressed that HIV treatment and prevention programmes faced a critical transition as they integrated the use of long-acting products. This would have far-reaching implications for DSD, healthcare client support and education, supply chains and commodity management, and prevention trial design. IAS 2023 should provide space to explore these issues, as well as questions of equitable access to long-acting products.

## Provide more opportunities for debate

Key informants were especially enthusiastic about debate formats within the IAS 2021 programme and wanted to see more opportunities for controversies in HIV science and programme implementation to be aired in debates. They also noted that IAS HIV Science conferences should continue to provide a venue for debates on future strategic directions in the HIV response.

## Prepare for hybrid conferences to be the new normal

Although a majority of survey respondents stated a preference for in-person attendance at future conferences, 80% agreed that a virtual element should become a permanent feature in IAS conferences. As reasons for enabling virtual participation, survey respondents cited ongoing uncertainties around COVID-19, the carbon costs of conference travel, and the opportunities for inclusion of a broader range of delegates. Striking a balance between the two modes of conference delivery will be challenging but has the potential to broaden access.



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- 15** Holmes C. Parallel pandemics - can HIV benefit from what has been built for COVID? [funding focus]. Symposium session: SY04. IAS 2021.
- 16** Bertagnolio S. Clinical characteristics and prognostic factors in people living with HIV hospitalized with COVID-19: Findings from the WHO Global Clinical Platform. Poster exhibition abstract: PEBLB20. IAS 2021.
- 17** Nomah DK. Unsuppressed plasma HIV-RNA is associated with worse COVID-19 outcomes among people living with HIV. Oral abstract Track B: OALB0301. IAS 2021.
- 18** IAS – the International AIDS Society – calls for people living with HIV to be included in priority populations for COVID-19 vaccine rollout. International AIDS Society press release, 15 July 2021.
- 19** Molina J-M et al. Efficacy and safety of long-acting subcutaneous lenacapavir in phase 2/3 in heavily treatment-experienced people with HIV: week 26 results (Capella study). Cross-track Oral abstract: OALX01LB02. IAS 2021.
- 20** Gupta S. Long-acting subcutaneous lenacapavir dosed every 6 months as part of a combination regimen in treatment-naïve people with HIV: interim 16-week results of a randomized, open-label, phase 2 induction-maintenance study (CALIBRATE). Oral abstract Track B: OALB0302. IAS 2021.
- 21** Czarnogorski M. CUSTOMIZE: overall results from a hybrid III implementation-effectiveness study examining implementation of cabotegravir and rilpivirine long-acting injectable for HIV treatment in US healthcare settings; final patient and provider data. Oral abstract Track B: OAD0705. IAS 2021.
- 22** Czarnogorski M et al. CAB+RPV LA implementation outcomes and acceptability of monthly clinic visits improved during COVID-19 pandemic across US healthcare clinics (CUSTOMIZE: hybrid III implementation-effectiveness study). Poster exhibition abstract: PED463. IAS 2021.

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- 23** Hoy J. Antiretroviral therapy: Time to change the paradigm? Prime session: PRO5. IAS 2021.
- 24** Reeves D. The passenger hypothesis: HIV exploits CD4 T cell homeostasis to promote long-term persistence of its reservoirs. Oral abstract Track A: OALBA0201. IAS 2021.
- 25** Trypsteen W. Identifying host genetic determinants of HIV-1 reservoir markers reveals PTSS2 and IRF7 as potential modifying factors in HIV-1 patients. Oral abstract Track A: OALAO202. IAS 2021.
- 26** Rasmussen T. Lower HIV reservoir size in individuals who maintain higher CD4+ T cells counts prior to antiretroviral therapy initiation: the Strategic Timing of Antiretroviral Treatment (START) HIV reservoir study. Poster exhibition abstract: PEBLB-13. IAS 2021.
- 27** Altfeld M. Sex-based differences in the immunological control of HIV. Symposium session: SY21. IAS 2021.
- 28** Karn, J. Hormonal control of HIV-1 latency by estrogen imparts gender-specific restrictions on the latent reservoir. Poster discussion session: MOPDA0101. IAS 2019.
- 29** Gianella S. Barriers to an HIV cure for women. *J Int AIDS Soc*, 2016. 19(1): 20706.
- 30** Scully E. Guidance in sex and gender research. Symposium session: SY21. IAS 2021.
- 31** Strongin Z et al. Dual IL-10 and PD-1 blockade in SIVmac239 infected macaques promotes sustained virologic control in absence of ART. Oral abstract Track A: OALA01LB02. IAS 2021.
- 32** Conradie F. High rate of successful outcomes treating highly resistant TB in the ZeNix study of pretomanid, bedaquiline and alternative doses and durations of linezolid. Oral abstract Track B: OALB01LB02. IAS 2021.
- 33** IAS – the International AIDS Society – calls for people living with HIV to be included in priority populations for COVID-19 vaccine rollout. International AIDS Society press release, 15 July 2021.
- 34** Lawrence DS. Single high-dose liposomal amphotericin based regimen for treatment of HIV-associated Cryptococcal Meningitis: results of the phase-3 Ambition-cm Randomised Trial. Oral abstract Track B: OALB01LB03. IAS 2021.
- 35** Isfordink C. Reaching HCV micro-elimination in HIV/HCV co-infected individuals in the Netherlands: exploring remaining barriers to HCV treatment. Oral abstract Track B: OAB0104, 2021.
- 36** Hosseini-Hooshyar S. Evaluation of the HCV cascade of care among people with HIV/hepatitis C co-infection in New South Wales, Australia: a data linkage study. Oral abstract Track B: OAB0105.
- 37** Rupasinghe D. Viral hepatitis cascade of care among adults living with HIV in Asia-Pacific. Oral abstract Track A: OALA0103.
- 38** Baptiste S. Role of people living in and vulnerable to HIV in measuring stigma in HIV prevention, treatment and care. Symposia session: SY51. IAS 2021.
- 39** Ganesan K. Who is missing from the HIV care cascade? Factors associated with not achieving the 90-90-90 targets among adults living with HIV in four African countries. Poster exhibition abstract: PED537. IAS 2021.
- 40** Wright C. The impact of HIV stigma on time to art initiation in four African countries. Poster exhibition abstract: PED519. IAS 2021.
- 41** Baptiste S. Role of people living in and vulnerable to HIV in measuring stigma in HIV prevention, treatment and care. Symposium session. SY51. IAS 2021.
- 42** Phanuphak Pungpapong N. U = U stigma. Symposium session: SY39. IAS 2021.
- 43** Apondi R. Gender-based violence shadows COVID-19: Increased sexual violence, HIV exposure and teen pregnancy among girls and women in Uganda. Oral abstract Track D: OAD0301. IAS 2021.
- 44** Leddy A. Sexual violence is longitudinally associated with reduced likelihood of viral suppression among transgender women living with HIV in Brazil. Oral abstract session Track D: OAD0303. IAS 2021.
- 45** Quan A. Improving health equity and ending the HIV epidemic in the United States: a distributional cost-effectiveness analysis in six cities. Oral abstract session Track D: OAD0201. IAS 2021.
- 46** Nardell M. Men missing from the HIV care continuum: a meta-analysis and meta-synthesis. Oral abstract session Track D: OAD0203. IAS 2021.
- 47** Nardell M. Men missing from the HIV care continuum: a meta-analysis and meta-synthesis. Oral abstract session Track D: OAD0203. IAS 2021.

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- 48** Auberson-Miunderi P. Maintaining HIV prevention in a new pandemic - program disruptions and adaptations during the COVID-19 crisis. Symposia session: SY06. IAS 2021.
- 49** Auberson-Miunderi P. Maintaining HIV prevention in a new pandemic - program disruptions and adaptations during the COVID-19 crisis. Symposia session: SY06. IAS 2021.
- 50** Green K. Differentiated PrEP delivery - from pilots to pushing towards the global PrEP targets. Symposia session: SY06. IAS 2021.
- 51** Xu J. Effectiveness and medication adherence of daily and event-driven pre-exposure prophylaxis regimens among Chinese men who have sex with men: A real-world CROPrEP study. Poster exhibition abstract: PECLB23. IAS 2021.
- 52** Cáceres FC. Early predictors of seroconversion among enrollees in a PrEP program in Brazil, Mexico and Peru – the ImPrEP demonstration study. Oral abstract Track C: abstract OAC0102, 2021.
- 53** Berg Cattani V. No impact of tenofovir/emtricitabine in estradiol exposure among transwomen on oral PrEP: results from the 12-week drug-drug interaction PrEPParadas substudy. Oral abstract Track C: OAC0601, IAS 2021.
- 54** Berg Cattani V. No impact of feminizing hormone therapy on daily oral pre-exposure prophylaxis effectiveness among Brazilian trans women vulnerable to HIV infection: the PrEPParadas Study. Poster exhibition abstract: PECLB29. IAS 2021.
- 55** Berg Cattani V. No impact of tenofovir/emtricitabine in estradiol exposure among transwomen on oral PrEP: results from the 12-week drug-drug interaction PrEPParadas substudy. Oral abstract Track C: OAC0601, IAS 2021.
- 56** WHO recommends the dapivirine vaginal ring as a new choice for HIV prevention for women at substantial risk of HIV infection. World Health Organization press release, 26 January 2021.
- 57** Nair G. Adherence to the dapivirine vaginal ring and oral PrEP among adolescent girls and young women in Africa: interim results from the REACH study. Oral abstract Track C: OALC01LB01. IAS 2021.
- 58** Hillier S. Safety and pharmacokinetics of oral islatravir once monthly for HIV pre-exposure prophylaxis (PrEP): week 24 analysis of a phase 2a trial. Oral abstract session Track C: OALC01: LB03. IAS 2021.
- 59** Chiavenna C. STI incidence among participants in the HIV Pre-exposure Prophylaxis (PrEP) impact trial in England. Oral abstract Track C: OAC0402. IAS 2021.
- 60** Williamson D. Emerging and re-emerging STIs in the genomic era. Prime session: PR01. IAS 2021.
- 61** Fairley C. STIs and drug resistance. Symposium session: SY53. IAS 2021.
- 62** Haas B. Is the rise in STI under PrEP acceptable? Symposium session: SY29. IAS 2021.
- 63** Wen-Wei Ku S. Sexualised drug use and HIV infection. Prime session: PR07. IAS 2021.
- 64** Alcamí P. The future of preventive HIV vaccines. Learning from HIV failure and COVID success. Symposium session: SY26. IAS 2021.
- 65** Caskey M. What we learned from HIV, what we did for SARS-CoV2. Symposium session: SY38. IAS 2021.